

Borehole

51-18-01

Log Event A

Borehole Information

Farm : <u>TX</u>	Tank : <u>TX-118</u>	Site Number : <u>299-W15-181</u>
N-Coord : <u>42,103</u>	W-Coord : <u>75,934</u>	TOC Elevation : <u>669.14</u>
Water Level, ft :	Date Drilled : <u>4/30/1974</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

This borehole was drilled in late April 1974 and was completed to 100 ft with 6-in. casing. The driller's log makes no reference to perforations or grout; therefore, it is assumed that the borehole was not perforated or grouted.

The casing thickness is assumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel casing.

The zero reference for the SGLS logs is the top of the casing. The top of the casing is level with the surrounding ground surface.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>11/1995</u>	Calibration Reference : <u>GJPO-HAN-3</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>4/25/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>99.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>35.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>4/26/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>36.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



Spectral Gamma-Ray Borehole Log Data Report

Page 2 of 3

Borehole

51-18-01

Log Event A

Analysis Information

Analyst : D.L. Parker

Data Processing Reference : P-GJPO-1787

Analysis Date : 1/23/1997

Analysis Notes :

This borehole was logged in two log runs. The pre- and post-survey field verification spectra for each log run met the acceptance criteria established for the peak shape and system efficiency. The energy and peak-shape calibration from the post-survey field verification spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during log run 1. The energy and peak-shape calibration from the pre-survey field verification spectra were used to establish the channel-to-energy parameters used in the processing the spectra acquired during log run 2.

Casing correction factors for a 0.280-in.-thick casing were applied during the analysis.

A depth overlap, where data were collected at the same depth on both logging runs, occurred from 35 to 36 ft. The concentrations of the naturally occurring gamma-ray-emitting radionuclides were calculated using the separate data sets at the overlapping depths. The calculated concentrations at the overlapping depths were within the statistical uncertainty of the measurements for all the measurements except the Th-232 concentration at a depth of 35.5 ft.

Cs-137 and Co-60 were the only man-made radionuclides detected in this borehole. Cs-137 was detected continuously from the ground surface to about 31 ft, intermittently from 32.5 to 36 ft, and at 99.5 ft (the bottom of the borehole). Co-60 concentrations were detected at 39 and 50.5 ft. The maximum Cs-137 concentration was 72 pCi/g at 1 ft. Zones of special interest on the Cs-137 plot are from the ground surface to 2 ft, 6 to 9 ft, 18 to 21 ft, and 22 to 27 ft.

The logs of the naturally occurring radionuclides show a pronounced increase in the K-40 concentrations at about 47.5 ft. The U-238 concentrations increase steadily from about 94 to 99.5 ft (the bottom of the borehole), with the maximum concentration of 1.3 pCi/g at about 98 ft. The Th-232 concentrations increase from 97 to 99 ft, with the maximum concentration of 1.3 pCi/g at about 98 ft.

The SGLS total count log plot reflects the log plots for the man-made and naturally occurring radionuclides. The upper 30 ft of the total count log reflects the Cs-137 concentrations. The total-count log plot shows a marked increase in activity at a depth of about 48 ft, reflecting the increase in K-40 concentrations. The total-count log plot below about 95 ft reflects concentrations shown on the U-238 and Th-232 plots.

Details concerning the interpretation of data for this borehole are presented in the Tank Summary Data Report for tank TX-118.

Log Plot Notes:

Separate log plots show the man-made radionuclides (Cs-137 and Co-60) and the naturally occurring radionuclides (i.e., K-40, U-238, and Th-232). The naturally occurring radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detection limit (MDL). The MDL of a radionuclide



Spectral Gamma-Ray Borehole
Log Data Report

Page 3 of 3

Borehole

51-18-01

Log Event A

represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes both the man-made and naturally occurring radionuclides, the total count log plot, as well as the Tank Farm gross-gamma log. The Tank Farm gross-gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma log plot to coincide with the SGLS data.